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ROCKY MOUNTAIN BEES. III[1]

BY T. D. A. COCKERELL AND RUTH SUMNER

THE GENUS *HYLÆUS* (*PROSOPIS*)

The name *Hylæus* was proposed by Fabricius in 1793 for a series of small bees, including what became later known as *Prosopis*, and also *Halictus*. Hence it resulted that some authors applied the name to *Prosopis*, others to *Halictus*, and in recent years the tendency has been to discard it altogether. Förster, in his elaborate 'Monographie der Gattung *Hylæus* F. (Latreille),' published in 1871, uses the older name in the sense of *Prosopis*, and Meade-Waldo, in the 'Genera Insectorum' (1923) also uses *Hylæus* in the same sense, remarking that Latreille (1802) fixed *Hylæus annulatus* as the type. Förster, in a footnote, remarks that the name *Prosopis* is objectionable, because already employed for a well-known genus of plants. That this argument is not without point is shown in Rivnay's recent 'Revision of the Rhipiphoridæ of North and Central America' (1929), where (p. 26) *Macrosiagon flavipenne* is said to have two recorded hosts, *Prosopis glandulosa* and *Bembex spinolæ*. The author was evidently not aware that the first name was not that of a bee, but of the mesquite on which the beetle happened to be found.

Förster's elaborate treatment of the Palæarctic species, including full descriptions and carefully constructed tables, appears at first sight to leave little to be desired. The fully recognized species number ninety-four, and there are thirteen others concerning which the author lacks sufficient information. Later writers, however, have consistently found fault with Förster's treatment, reducing many of his names to the synonymy. Meade-Waldo (1923) summarizes the results of this destructive criticism, wherein, for example, no less than fifteen Förster "species" are placed under *H. brevicornis* Nylander. These are admitted not to be exactly alike, and are placed in three groups: *brevicornis* proper, variety *imparilis* (Förster), and variety *kahri* (Förster). Some of Förster's names, as *H. prænotatus* and *H. marginatus*, remain in the list, not because they are known to be valid, but because they could not be found in Förster's collection, and are not known, as synonyms or other-

[1]Nos. I and II of this series appeared in American Museum Novitates Nos. 433 and 458, respectively.

wise, to modern writers. Alfken (Abh. Nat. Ver. Bremen, 1904) gave a detailed account of Förster's collection, setting forth the synonymy as he understood it. In Meade-Waldo's list there are one hundred and fifty-eight species of Palæarctic *Hylæus* treated as distinct. Since then, five species and a race have been added by Alfken, and fourteen species from eastern Siberia (Maritime Province) were published in 1924 by Cockerell. There is also *Hylæus atrocallosus* (Morawitz), from Turkestan, accidentally omitted by Meade-Waldo. Thus the matter stands at present, but adequate structural studies of the Palæarctic species have not yet been made, and it is not improbable that a future reviser, with more adequate collections, will greatly transform the aspect of the list.

For the Nearctic region, Meade-Waldo cites forty-two species, and a considerable number of varieties. Since then, a species (*H. sonorensis* Cockerell) from Sonora and one (*H. giffardiellus* Cockerell) from California have been added. The foundation for all modern studies of Nearctic *Hylæus* is the great work of Charles W. Metz 'A Revision of the Genus *Prosopis* in North America' (Trans. Amer. Ent. Soc., 1911). This paper, when it appeared, created a certain amount of prejudice by its dogmatic style, and subsequent studies indicate that in several cases Metz was too hasty in reducing names to the synonymy. Nevertheless, all things considered, it is an extremely valuable work, no doubt the best ever done on the genus. From the standpoint of general biology, it may have been the best thing for Metz to drop the study of bees and take to genetics; but students of bees can only regret that he did not continue what he had so well begun.

The study of the Rocky Mountain collections obtained by Dr. Frank E. Lutz serves to confirm the view that most of the species are already known. Whereas in *Halictus*, *Andrena*, and some other large genera, new species are continually coming to light, the *Hylæus* fauna in North America seems rather limited. Certainly it is not so rich or varied as in some other parts of the world. The few new species obtained by Dr. Lutz are all very small, and perhaps they are not so rare as now appears, for they can, like *Perdita*, pass readily through the ordinary net, and escape. In the case of *Perdita*, this difficulty is usually overcome by the large number of specimens present, so that several are likely to be captured, but this would not be true in the case of *Hylæus*.

The specimens were all taken by Dr. Lutz, unless the contrary is stated, and will be found in the collection of The American Museum of Natural History, where the Metz collection is also preserved.

Hylæus verticalis (Cresson)

Prosopis tridentula Cockerell, male, was said to differ from *P. verticalis* by the shorter antennæ and first recurrent nervure entering second cubital cell. The type is from Chamber's Lake, Larimer County, Colorado, 9500 ft. altitude.

In Cockerell's (1898) key in Entomologist, XXXI, p. 186, we find:

First abdominal segment smooth; end of lateral face-marks above on a smooth shining space..... *verticalis.*
First abdominal segment punctured.
Somewhat larger, face broader, face-marks creamy white..... *tridens.*
Somewhat smaller, face narrower, face-marks strongly yellow.... *tridentula.*

Metz subsequently dissected males of *H. tridens* Cockerell and found them structurally identical with *H. tridentulus*, and his conclusion that they represent one species appears justified.

The senior author had for some time past differed from Metz's interpretation of the female of *H. varifrons*, referring to that species specimens which Metz had as "possible" *tridentulus*, and placing under *verticalis* essentially the same thing as the *varifrons* of Metz. However, among the specimens studied by Metz are males and females from Florissant, Colorado, and Beulah, New Mexico. The males are perfectly typical *H. varifrons* (Beulah) and *H. tridentulus* (Florissant). In the male *varifrons* the sides of the first tergite have very well-separated punctures, and little punctures between, and the sides of the second tergite have very small punctures; the wings are very brown. In the male *tridentulus* the sides of the first two tergites have much stronger, round punctures; the lateral hind margins of the first two tergites show white hair (wholly lacking in *varifrons*); the wings are clear. In the female from Beulah there are very delicate punctures on sides of first two tergites; no white hair at lateral apices of tergites; wings brownish. In the female from Florissant the punctures at sides of tergites are stronger, and the white hair is very evident. There can be no doubt that these females belong to the males, and for purposes of rapid recognition it must be noted that the lateral face-marks of *tridentulus* are broader, and turn inward (away from eyes) at the upper end.

The senior author received a letter from Mr. J. C. Crawford, dated March 30, 1917, containing the following information: "Yesterday I made a very interesting discovery in the genus *Prosopis*. I have from around here specimens of Cresson's species *verticalis*, and upon dissection of the male find that the characters are identical with what Metz publishes as your species *tridentulus*. So far I have not made a careful

examination of your type, which is in our (U. S. Nat. Museum) collection, but superficially the two forms seem to differ only in size."

The conclusion must apparently be that *H. verticalis* is the correct specific name for this insect; but probably the Rocky Mountain form deserves to stand as a subspecies, *H. verticalis tridentulus*.

COLORADO.—Males: Boulder, May 23, 1913, at privet; Cornet Creek, Telluride, July 9, 1919, alt. about 10,000 ft.; Ward, July 7, 1922, G. W. Strawbridge, collector. Females: Boulder, June 18, 1922, at *Scrophularia occidentalis;* Boulder, May 24, 1918, at *Oreobatus deliciosus;* Longs Peak Inn, July 14 (Cockerell); Ouray, July 11–14, 1919, alt. about 8400 ft.; Starkville, June 13, 1919, alt. about 6800 ft.

WYOMING.—Female: Stewart Ranger Station (Jackson Hole district), July 18, 1920, alt. about 6700 ft.

Hylæus ellipticus Kirby

It now appears certain that *Prosopis varifrons* Cresson, 1869 (type from Colorado) must be included in *H. ellipticus*. Lovell (Psyche, October, 1910) separates the females thus:

Tegulæ spotted, marks nearly white.....*varifrons.*
Tegulæ dark, marks pale yellow.....*elliptica.*

He describes both as having a transverse mark on clypeus. Cresson states that *varifrons* female sometimes had a transverse stripe on clypeus.

In the Entomologist (1898) key, Cockerell separated the females thus:

Collar all dark (excluding tubercles), markings yellow, clypeus all dark....*varifrons.*
Collar partly light, a light band on lower edge of clypeus..*ellipticus* (from Canada).

No Colorado specimens referred to *H. ellipticus* have the collar (upper border of prothorax) all dark; Lovell describes it as all dark in the females of both species. Seven Colorado females have the transverse mark on clypeus distinct but variable. Three Colorado females (Tennessee Pass, Leadville, Ouray) have the transverse mark reduced to a couple of dots, representing its ends. One from the Yellowstone National Park, Wyoming, is similarly marked. Three Colorado females (Tennessee Pass and Lawn Lake) have the clypeus all dark. All these have spots on the tegulæ; but one female (Longs Peak Inn, Colorado, July, Cockerell) has a black clypeus and entirely black tegulæ.

It is probable that the common Colorado insect may be recognized as a race, *Hylæus ellipticus varifrons*, with light spots on the tegulæ, and typically with no light band on the clypeus. *H. ellipticus* was originally based on the female, from far north in British America, and it is unfortunate that no males are available from that region. The color of the face-markings varies from yellow and whitish in females from Ward and Electra Lake; it is evidently not reliable for specific distinction.

COLORADO.—Males: Aspen, July 24–27, 1919, alt. about 11,000 ft.; Boulder, May 24, 1913, on *Hydrophyllum fendleri*, Ellis Collection; Electra Lake, June 28–July 1, 1919, alt. about 8400 ft.; Ouray, July 11–14, 1919, at *Achillea millifolium*, alt. about 8500 ft.; Rifle, July 19–21, 1919, alt. about 5400 ft.; South Fork, June 17, 1919, alt. about 8200 ft.; Ward, August 8–10, 1919, June 25, 1922, July 7, 1922, alt. about 9300 ft. Females: Electra Lake, June 28–July 1, 1919, alt. about 8400 ft.; Lawn Lake, Rocky Mt. Nat. Park, August 22, 1919, H. F. Schwarz, collector; Leadville, August 3–5, 1919, alt. about 10,200 ft., H. F. Schwarz, collector; Longs Peak, June 14–19, 1922, alt. about 9000 ft.; Ouray, July 11–14, 1919, alt. about 8500 ft.; Tennessee Pass, August 6–8, 1920, alt. about 10,500 ft.; Ward, August 8–10, 1919, June 25, 1922, alt. about 9300 ft.

WYOMING.—Males: Stewart Ranger Station (Jackson Hole district), July 18, 1920, Mrs. F. E. Lutz, collector. Females: Near Old Faithful, Yellowstone National Park, July 24–25, 1920, alt. about 7500 ft.

Hylæus basalis (Smith)

COLORADO.—Males: Boulder, June 20, 1922, June 6, 1922, alt. about 5600 ft., Frank B. Lutz, collector; Ward, June 25, 1922, alt. about 9300 ft., Frank B. Lutz, collector. Females: Aspen, July 24–27, alt. about 8500 ft., H. F. Schwarz, collector; Electra Lake, July 1, 1919, at *Potentilla filipes*, alt. about 8400 ft.; Ouray, July 11–14, 1919, alt. about 8500 ft.; Ward, June 25, 1922, at dandelion, alt. about 9300 ft.

WYOMING.—Females: Camp Roosevelt, Yellowstone Park, July 14–17, 1923.

Hylæus cressoni (Cockerell)

COLORADO.—Males: Boulder, August 7–12, 1919, at *Solidago*, alt. about 5500 ft.; Meeker, July 20–21, 1919, alt. about 6200 ft.; Monte Vista, June 16, 1919, alt. about 7600 ft.; Wray, August 17–19, 1919, alt. about 3700 ft. Females: Boulder, May 23, 1913, Ellis Collection; Boulder, August 7–12, 1919, at *Solidago*, alt. about 5500 ft.; Boulder, June 18, 1922, at *Scrophularia occidentalis;* Glenwood Springs, August 5, 1920, alt. about 5800 ft.; Jim Creek, near Boulder, July 8–11, 1922, alt. about 6400 ft., Mrs. F. E. Lutz, collector; Tennessee Pass, July 30–August 2, 1919, alt. about 10,300 ft.; Wray, August 17–19, 1919, alt. about 3700 ft.

IDAHO.—Females: Giveout, July 7, 1920, alt. about 6700 ft., Mrs. F. E. Lutz, collector.

UTAH.—Males: Ogden, August 29–30, 1916.

WYOMING.—Females: Green River, July 2, 1920, alt. about 6100 ft.

Hylæus mesillæ (Cockerell)

Four Colorado females certainly belong here. We had to consider whether they could be *H. magniclavis* (Swenk and Cockerell), a species from the Bad Lands of Nebraska, which might be expected in Colorado; but the basitarsi are clear yellow or whitish, whereas in *H. magniclavis* they are largely dark. The face-marks are also a little different, but variable.

COLORADO.—Females: Boulder, May 22, 1913, at *Bursa bursa-pastoris;* Boulder, August 7–12, 1919, at *Solidago*, alt. about 5500 ft.

Hylæus modestus (Say)

We have a considerable series of females in the Lutz collection but no males. All have much yellow on collar, so they are not of the species or form *H. citrinifrons* Cockerell. They do, however, agree with the description of *Prosopis nucleolus* Viereck, from Beulah, New Mexico, and must certainly belong to that form. It is not apparent at present how this supposed species can be definitely separated from *H. modestus*.

All lack a yellow mark on base of wing; some (Jim Creek, South Fork of Rio Grande, Aspen, Colorado; and Stewart Ranger Station, Wyoming), lack the spot on tegulæ, but others (Electra Lake and Pagosa Springs) have spotted tegulæ.

COLORADO.—Females: Aspen, July 24–27, 1919, alt. about 8500 ft.; Electra Lake, June 28–July 1, 1919, alt. about 8400 ft.; Jim Creek, near Boulder, July 21–23, 1922, at *Œnothera*, alt. about 6400 ft.; Pagosa Springs, June 22–24, 1919, alt. about 7200 ft.; South Fork of Rio Grande, July 18–19, 1919, alt. about 9200 ft.

WYOMING.—Females: Stewart Ranger Station (Jackson Hole district), July 18, 1920, alt. about 6700 ft.

Hylæus coloradensis (Cockerell)

We have both sexes. The females, with broad face and reduced lateral face-marks, agree with Metz's account. *H. tuertonis* (Cockerell), from Tuerto Mountain, New Mexico, is a smaller species, with narrower face, the lateral marks very pale. It must be distinct, and not the female of *coloradensis* as has been supposed.

COLORADO.—Male: Boulder, May 29, 1922, at *Erigeron*, alt. about 6400 ft.; Jim Creek, near Boulder, September 2, 1922, alt. about 6400 ft.; Longs Peak Inn, June 16, 1922, alt. about 9000 ft. Female: Ouray, July 11–14, 1919, alt. about 8300 ft.; Tennessee Pass, August 6–8, 1920, alt. about 10,500 ft.

UTAH.—Female: Ogden, July 25, 1920, alt. about 4300 ft.

Hylæus gaigei (Cockerell)

Female with wholly black face.

UTAH.—Ogden, July 25, 1920, alt. about 4300 ft.

Hylæus wootoni (Cockerell)

Many females. Distinguished from *H. rudbeckiæ*, as Metz indicates, by the conspicuously and strongly punctured first tergite. They are female *H. wootoni* in the sense of Metz, who included *H. divergens*. The name *H. wootoni* was originally based on the male.

COLORADO.—Females: Estes Park, July 19, 1916, August 13–19, 1919; Jim Creek, near Boulder, July 21–23, August 3, 1922, alt., about 7000 ft.; Ouray, July 11–14, 1919, alt. about 8400 ft.; Regnier, June 6–9, 1919, alt. about 4400 ft.; Schmoll's Ranch near Ward, July 3, 1922, G. W. Strawbridge, collector.

UTAH.—Females: Ogden, August 29–30, 1916, July 25, 1920, alt. about 4300 ft.

Hylæus rudbeckiæ (Cockerell and Casad)

Some of the specimens have the characters of the form *ruidosensis* Cockerell, but it is probably not a distinct race.

COLORADO.—Males: Boulder, June 6, 1922, alt. about 6900 ft.; Boulder, June 20, 1922, "Dancing" over the moist bank of a brook, alt. about 5600 ft.; Ward, June 25, 1922, alt. about 9300 ft. Females: White Rocks, near Boulder, August 13, 1919, alt. about 5200 ft.

UTAH.—Males: Huntsville, July 26, 1920; Ogden, August 29–30, 1916. Females: Ogden, August 29–30, 1916.

WYOMING.—Female: Green River, July 2, 1920, alt. about 6100 ft.

Hylæus episcopalis (Cockerell)

COLORADO.—Males: Boulder, June 7, 1922, June 20, 1922, alt. about 6000 ft.; Frank B. Lutz, collector.

IDAHO.—Males: Bear Lake, July 9, 1920, alt. about 6200 ft.; Moscow Mts. July 8, 1898.

Hylæus stevensi (Crawford)

These males do not agree with Crawford's figure (Canad. Entomologist, May, 1913), having the upward extension of the lateral marks much narrower, but they do agree substantially with a specimen received from Crawford, collected at Fargo, North Dakota, the type locality.

The face-markings quite closely resemble those of *H. modestus* variety *minyra* (Lovell), as figured by Metz.

COLORADO.—Male: Glenwood Springs, August 5, 1920, alt. about 5800 ft.

IDAHO.—Male: Bear Lake, July 9, 1920, alt. about 6200 ft.

UTAH.—Male: Provo, July 29–August 1, 1920, alt. about 4500 ft.

WYOMING.—Male: Green River, July 2, 1920, alt. about 6100 ft.

Hylæus dunningi (Cockerell)

The known range is greatly extended by a male and two females from Utah. One of the females has the tegulæ spotted, the other not.

UTAH.—Male: Provo, August 1, 1920. Female: Provo, July 20–August 1, 1921, alt. about 4500 ft., Mrs. F. E. Lutz, collector.

Hylæus divergens (Cockerell)

Although Metz was convinced that this species could not be separated from *H. wootoni*, we believe it to be a valid, though closely allied, species. In the male genitalia the sagittæ extend well beyond the stipites; and externally the species can be recognized by the smaller size, spotted tegulæ, and the form of the lateral face-marks. In *H. wootoni* the upper extension of the lateral face-marks is elongate, with its

inner border distinctly concave, whereas in *H. divergens* the inner border is convex. The color of the face in *divergens* is typically very pale, creamy white. The Arizona specimens noted below have the face a shade yellower, but this is unimportant. So far as we know, *H. divergens*

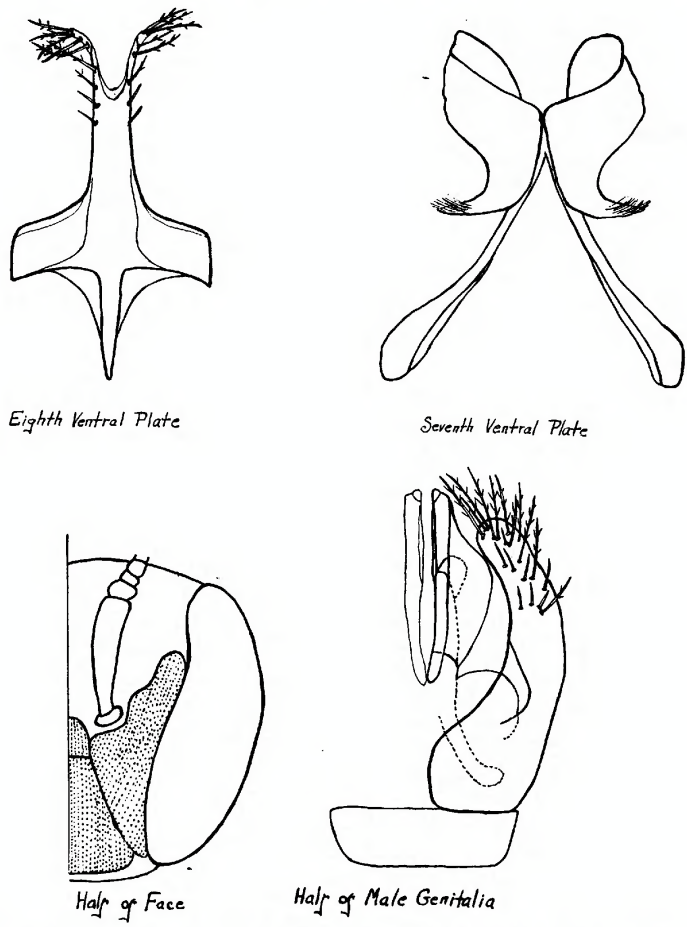

Fig. 1. Face-Marks and abdominal structures of *Hylæus divergens* from Bear Wallow, Arizona.

extends from Monroe Canyon, Sioux County, Nebraska (R. W. Dawson) to Arizona. It ascends to at least 9000 ft. in the mountains (Ute Creek, Colorado, L. Bruner). We are not at present able to say how the female may be distinguished from that of *H. wootoni*. However, we have one female which doubtless should be *divergens*. It was taken at the same

time and from the same place as the males and has the tegulæ with light spots. From analogy with other species, the spotting of the tegulæ is presumably not a valid specific character.

ARIZONA.—Males and female: Bear Wallow, Santa Catalina Mts., July 12–17, 1916, alt. about 8200 ft.

Hylæus conspicuus (Metz)

Metz described this species from Ormsby County, Nevada (type locality), and California. A female from Jackson, Wyoming, July 15, 1920, alt. about 6300 ft., greatly extends the known range. Compared with a female from California, and with the figure given by Metz, the clypeal mark is greatly reduced, but it does not seem possible to separate it as a race, since Metz says merely "spot on clypeus usually present."

Hylæus laciniatus, new species

MALE.—Length about 4.5 mm.; slender. Black, with light markings creamy white, consisting of entire face below antennæ, long supraclypeal mark extending well above antennæ and ending in a point on front; lateral face-marks ending at about same level as supraclypeal mark, obliquely truncate with point mesad, and whole upper extension distinctly separated from the orbit; scape light in front. Third antennal joint very short, nearly twice as broad as long; fourth longer but still short; flagellum rather long, pale, ferruginous beneath. Mandibles black, slightly reddish at apex; labrum black. Tubercles with light spot; tegulæ dark brown with a faintly indicated spot; base of wing with a light mark. Cheeks weakly punctate and strongly striate; front coarsely punctate and strongly striate between punctures, Mesothorax shining but not polished, with rather strong but well-separated punctures. distance between them on the disk about equal to a puncture width; scutellum broad and flattened, the punctures rather large but not so large as on hind part of mesothorax; postscutellum minutely roughened; area of metathorax broadly semilunar, strongly irregularly sculptured, with more or less anastomosing longitudinal rugæ; the intervals shining and crossed by very fine plicæ; mesopleura sparsely punctate and the lower part with long glistening white hairs; the whole thorax being rather hairy for *Hylæus*. Anterior knees and tibiæ in front, and middle tibiæ in front, and middle tibiæ at apex and base, and anterior and middle basitarsi creamy white; small joints of these tarsi becoming pale-reddish apically; hind tibiæ with nearly basal half and hind basitarsi and two following joints creamy white, but last two joints brown. Wings hyaline, stigma and nervures brown, basal nervure falling just short of nervulus; both recurrent nervures meeting the intercubitals; hind wing with five hooks. Abdomen brownish, smooth, very sparsely and weakly punctured, punctures on first tergite distinct under microscope and widely spaced; tergites with very fine transverse lineolation; no hair-bands or patches.

COLORADO.—Boulder, May 24, 1913 (F. E. Lutz).

The eighth ventral plate does not resemble any species diagrammed by Metz or Crawford. The body is broad; the basal pedicel seems to be split in two parts and is almost as broad at the distal portion as at the

base. The apical portion is not lobed but tapers slightly from the body outward.

The seventh ventral plate most nearly resembles *H. grossicornis.* The proximal arms extend out farther from the median line, giving it a much broader aspect than that of *H. grossicornis.* The length of the

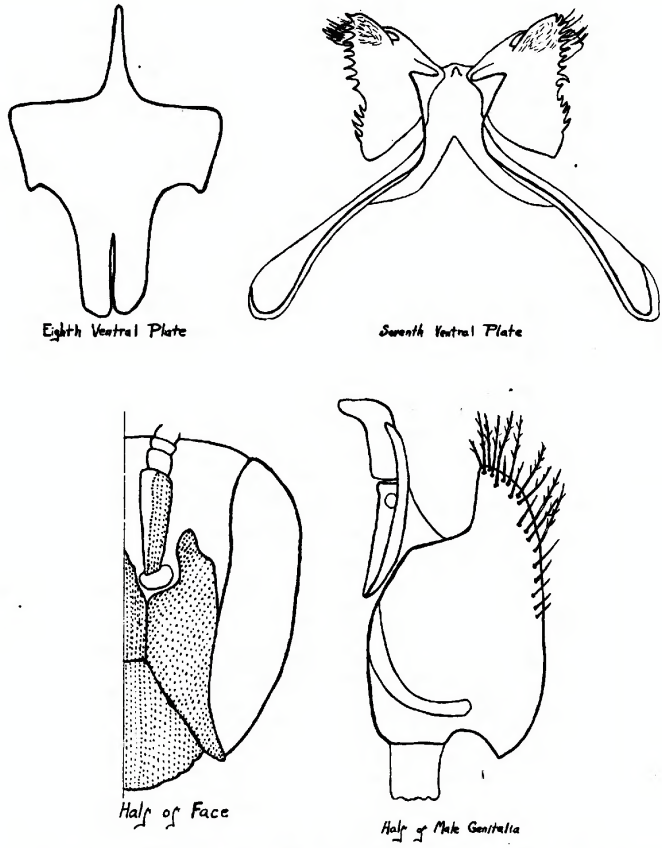

Fig. 2. Face-marks and abdominal structures of *Hylæus laciniatus.*

toothlike projections on the wings does not gradually diminish as the wings approach the proximal arms.

The stipites are very broad and the apical portion is not particularly tubular. The sagittæ are much longer than the stipites. The genitalia more nearly resemble those of *H. conspicuus* than any other.

Hylæus perparvus, new species

MALE.—Length about 4 mm. Black with light markings dull, pale yellowish, almost ochreous. Face not conspicuously broadened above as in *H. seclusus;* face

all light below antennæ except that supraclypeal mark is triangular, its apex at about lower level of antennal sockets, leaving a wedge-shaped black space on each side; lateral marks broad in middle, the width somewhat greater than that of supraclypeal area, tapering above to end before middle of front rather obtusely and at extreme apex a little away from orbit. Scape short, stout, finely rugose, without light markings; flagellum dull ferruginous beneath; labrum, mandibles, and ex-

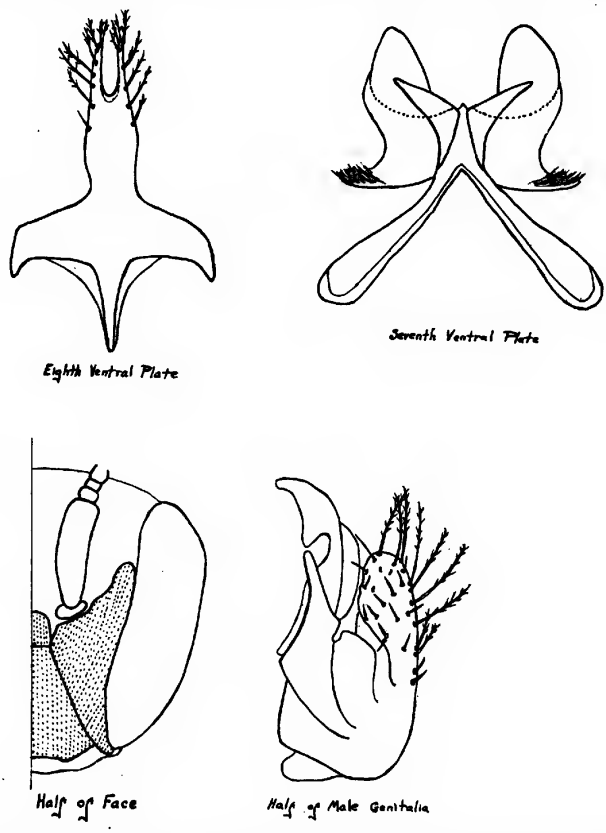

Fig. 3. Face-marks and abdominal structures of *Hylæus perparvus*.

treme lower margin of clypeus black; front punctured, and with a strong, conspicuous and shining median sulcus. Two lines on upper border of prothorax, small spot on tubercles and spot on tegulæ light; mesothorax minutely rugose, closely punctured, punctures on disc separated much less than width of punctures. No light spot on base of wing. Scutellum sculptured like mesothorax but punctures larger and not so dense; post-scutellum rugose; area of metathorax rugose, minutely longitudinally plicate, the plicæ irregular and often not parallel; mesopleura finely rugose and well punctured. Anterior tibiæ light in front, anterior tarsi brown; middle tibiæ with

light spot at base and not at apex; hind tibiæ with about two-fifths of base light; middle and hind tarsi with basitarsi creamy white, but with apex of basitarsi rather brown. Abdomen shining with minute sparse punctures visible under binocular.

COLORADO.—Estes Park, July 19, 1916, F. E. Lutz, collector.

The eighth ventral plate very much resembles *H. cookii* except that the basal pedicel is a little stouter near the base and tapers to the apices, while this is not so in *H. cookii*.

The seventh ventral plate most nearly resembles that of *H. polifolii*. The lobes of the wings are not so narrow and are not so long as *H. polifolii*. The wings are not constricted at the base of the lobes, and the membranous flaps are more rounded, not so elliptical as in *H. polifolii*.

The sagittal rods protrude some distance beyond the apical portions of the stipites, and are curved inward toward the center. The apical portion of the stipites does not taper, but instead is broader at the apices than at the base. Tiny hairs extend about half-way down the stipites.

Hylæus seclusus, new species

MALE.—Length about 5 mm. Black; head and thorax dull, abdomen brilliantly shiny; wings slightly brownish; light markings dull yellowish-white. Face of type slightly reddened by cyanide; orbit strongly converging below so that the face rapidly broadens above; face all light below antennæ; supraclypeal mark pointed, but little elongated above, though longer than broad; lateral marks going about half-way up front, broad, obliquely truncate, with apical point on orbital margin; mandibles and labrum black. Scape all black and rather thick, expanded at apex, minutely and densely rugose; flagellum bright ferruginous beneath. Front densely and finely punctured. Two marks on upper part of prothorax and rather small spots on tubercles light; tegulæ dark brown without any light mark; mesothorax densely punctured, rugose between punctures which on disc are separated by less than a puncture width; scutellum finely punctured; area of metathorax large, pointed behind, the apical angle about a right angle, the surface with fine irregular plicæ forming a reticulation; mesopleura minutely rugose and quite closely punctured; hair of thorax scanty. Anterior tibiæ with about basal three-fifths light in front, knees dark, anterior tarsi brown; middle knees also dark, middle tibiæ with a light spot at base but not at apex, middle tarsi with basitarsi creamy white except at apex; hind tibiæ with at least basal two-fifths light. Nervures and stigma dark brown, basal nervure falling a considerable distance short of nervulus. Abdomen polished, with fine distinct punctures; no distinct hair-bands or spots.

COLORADO.—Ouray, July 11–14, 1919, alt. about 8500 ft., F. E. Lutz, collector.

The eighth ventral plate does not closely resemble any illustrated by Metz. The apical lobes are stouter in the middle region and taper to the apices. The body is somewhat triangular in shape and the basal pedicel is narrow and pointed.

The seventh ventral plate most nearly resembles the diagram of *H. polifolii*. The distal portion of the proximal arms is not the same shape and the lobes of the wings do not extend out as far as do those of *H. polifolii*.

The transparent base of the genitalia resembles that of *H. wootoni* in shape. The sagittæ do not resemble this form, but closely resemble the sagittæ of *H. tridentulus*.

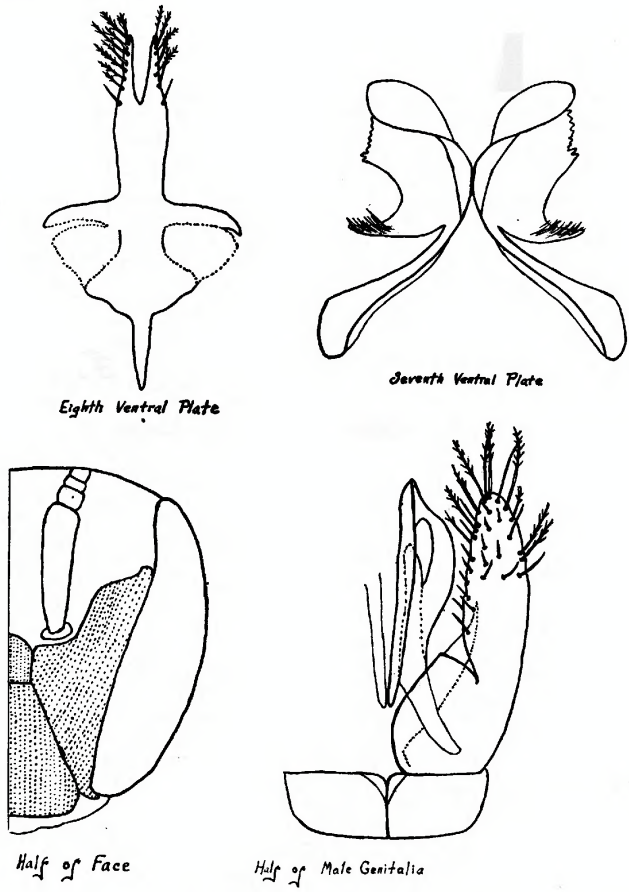

Fig. 4. Face-marks and abdominal structures of *Hylæus seclusus*.

Hylæus repolitus, new species

FEMALE.—Length a little over 5 mm.; rather robust. Light markings creamy white; face broad, clypeus entirely black; lateral marks narrow, not extending above lower level of antennæ, clypeus glistening, minutely striate, weakly punctured; supraclypeal area similarly striate with a row of punctures on each side; front finely punctured with a median impressed line; facial foveæ narrow, bordered outwardly by

a shining line, not nearly reaching lateral face-marks. Mesothorax and scutellum conspicuously shining, with fine very distinct punctures; upper border of prothorax black, but tubercles broadly light; tegulæ with a small spot; postscutellum large, finely punctured; area of metathorax large, convex, very finely lineolate and rugulose at base but remarkably free from sculpture, having no longitudinal plicæ; mesopleura with widely spaced punctures on a finely rugose surface. Wings slightly dusky; stigma and nervures brown; basal nervure meeting nervulus a little on outer side; first recurrent nervure joining second cubital cell near base; five hooks on hind wing. Legs black; tarsi dark brownish; hind tibiæ pale at base. Abdomen shining, hind portion finely hairy and having only very minute piliferous punctures; middle of first tergite impunctate, though there are distinct punctures laterally.

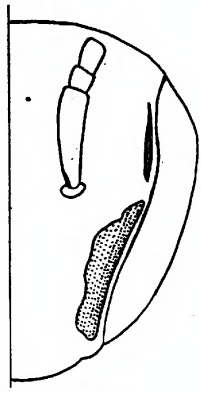

Fig. 5. Face-marks of *Hylæus repolitus*, female.

UTAH.—Ogden, July 25, 1920, alt. about 4300 ft., F. E. Lutz, collector.

This species is readily known by the conspicuously shining mesothorax and scutellum, and the character of the metathorax. The face-marking is similar to that of *H. coloradensis* as figured by Metz, but that species has a broader face, the face-marks are less parallel, and the mesothorax is entirely dull.

The great difficulty in dealing with Rocky Mountain *Hylæus* has to do with the identification of the females. For ready reference, the following tabulation will be of some service.

1.—Face all black.....2.
Face not all black.....4.
2.—Large; anterior wing about 6.5 mm. long; wings brownish; no light marks on thorax.....*basalis* Smith.
Much smaller.....3.
3.—No light marks on thorax; wings clear.....*personatellus* Cockerell.
Tubercles and upper border of prothorax marked with pale yellow; wings brownish.....*gaigei* Cockerell.
4.—Clypeus with light marking.....5.
Clypeus all black.....7.
5.—Lower margin of clypeus with a transverse light mark, sometimes reduced to a pair of dots.....*ellipticus* Kirby.
Clypeus with a longitudinal light mark.....6.
6.—Rather large species, about 6 to 7 mm. long.....*conspicuus* Metz.
Very small species; basitarsi all yellow.....*mesillæ* Cockerell.
7.—Collar all black, with tubercles with a light spot.....8.
Collar with light marks.....11.
8.—Small species, anterior wing not over 3.7 mm. long.....9.
Much larger and more robust species.....10.
9.—Mesothorax dull.....*cressoni* Cockerell.
Mesothorax shining.....*repolitus* Cockerell and Sumner.

10.—Lateral face-marks curved away from orbit at upper end. . . *verticalis* Cresson.
Lateral face-marks not curved away from orbit.
ellipticus Kirby (*varifrons* Cresson).

11.—Small species; anterior wing not over 3.7 mm. . . . . 12.
Much larger and more robust, first tergite practically impunctate. . . . . 13.

12.—Lateral face-marks long and narrow, going well above level of antennæ; first tergite very conspicuously punctured.
wootoni Cockerell (and *divergens* Cockerell).
Lateral marks broader, and short, not going above level of antennæ; first tergite very weakly and inconspicuously punctured.
rudbeckiæ Cockerell and Casad.

13.—Lateral face-marks minute; scutellum somewhat shining. . *coloradensis* Cockerell.
Lateral face-marks large and conspicuous; scutellum larger, less shining. . . . 14.

14.—More robust; mesothorax dull and very densely punctured all over; face much broader. . . . . *modestus* Say.
Less robust; mesothorax more shining and less punctured; face much narrower.
episcopalis[1] Cockerell.

[1](Metz says female *H. episcopalis* is known by the long lateral face-marks, long clypeus, and abdomen punctured as in the male, i.e., first tergite smooth, conspicuously punctured with small punctures, separated by two or three times the diameter of one puncture.)